

Evaluation of Teamwork in Healthcare

Dana Dolanová

Department of Nursing, Faculty of Medicine, Masaryk University Brno
Department of Nursing, Faculty of Health Care, Catholic University Ružomberok

ABSTRACT

Objective: The theoretical study aimed to briefly characterize the team and teamwork in healthcare, its assessment, and to present selected measurement tools designed to assess teamwork in healthcare.

Background: The paper centred on validation studies of several authors (Kalisch, Weaver, Salas, 2009; Kalisch, Lee, Salas, 2010; Kalisch, Lee, Rochman, 2010; Shteynberg, Sexton, Thomas, 2005; Sexton, Helmreich, Neilands et al. 2006; Ryan, 2008, Ryan, Cott, 2008), whose focal point was the development of measurement and assessment tools that investigate the efficiency, functionality, and team culture of nursing and/or multi-disciplinary teams in healthcare.

Methods: The measurement tools for assessing teamwork in health care published and validated internationally have been analyzed analytically and synthetically. The analysis was based on research of peer-reviewed full-text online databases (EBSCO, SCOPUS, Web of Knowledge).

Conclusion: In connection with the growing demand for all types of teams working in the healthcare sector, it is necessary to expand the knowledge base for the specific issues of the functioning of the team in healthcare and the assessment of its effectiveness or functionality. Implementation of the selected measurement tools into Slovak practice would require a profound national validation, the process of which is currently under preparation.

KEY WORDS

team, teamwork, health care, nursing, teamwork assessment, teamwork questionnaire, teamwork survey

INTRODUCTION

Teamwork is vital in health care because the treatment of a single patient requires a number of interventions provided by many different professionals. In general, a team is a small group of people working together toward a common goal.

An apt definition of teamwork that easily applies in healthcare was given by Hoegl and Gemuenden (2001, p 436), who defined teamwork as “the quality of both task-related and social interaction within teams.” According to Cohen and Bailey (1997, p 241) the following three aspects of the above definition are noteworthy:

- teamwork expresses the interaction between individuals in contrast with the quality of their joint activities (e. g. appropriateness of their jointly developed treatment plan),
- teamwork is the result of task-related and social interactions, and
- specifies that the interactions take place between the members of the team.

In relation to the relevance of team and teamwork in healthcare it is necessary to seek methods for their improvement; therefore the present study primarily focuses on the evaluation of nursing and multidisciplinary teams.

METHODS

The analytic-synthetic approach involved various analyzed measuring tools for assessing the functioning of teams and teamwork in healthcare. The analyses were based on electronic resources generated through our search of peer-reviewed full-text online databases (EBSCO, SCOPUS, Web of Knowledge), which were in Slovak, Czech, and English and included the following key words: *tím, tímová práca, zdravotníctvo, ošetrovateľstvo, hodnotenie tímovej práce, dotazník tímovej práce, tým, tímová práca, zdravotníctví, ošetrovateľství, hodnocení týmové práce, dotazník týmové práce, team, teamwork, healthcare, nursing, teamwork assessment, and teamwork questionnaire*. The above databases generated over 1,500 results for the search

period from 2000 to 2011. Gradually sorting the results to eliminate those that did not meet the research design we ultimately arrived at 123 results (EBSCO – 32, SCOPUS – 23, and Web of Knowledge – 68). The final phase involved 30 full-text studies. The criterion for selecting the results was that the measurement tool was applicable either in a multidisciplinary team or a nursing team. On this basis, we chose two measuring tools that examine multidisciplinary teams (DTEAM, SAQ) and one that assesses nursing teams (NTS). The present study hence focused on validation studies of several authors (Kalisch, Weaver, Salas, 2009; Kalisch, Lee, Salas, 2010; Kalisch, Lee, Rochman, 2010, Shteynberg, Sexton, Thomas, 2005; Sexton, Helmreich, Neilands et al. 2006; Ryan, 2008, Ryan, Cott, 2008), whose focal point was the development of measuring and evaluating tools that investigate the efficiency, functionality, and team culture of nursing and/or multi-disciplinary teams in healthcare.

TEAMWORK IN HEALTHCARE

According to Jarošová (2000, p 41), as medical care is increasingly specialized, patient care is more and more carried out by a cooperating group of functionally dependent health professionals.

Teamwork is integral to a holistic approach to patient care, to satisfying all the patient's needs, to eliminating adverse symptoms of the disease, and to fully curing the patient if possible. In healthcare the team is usually multidisciplinary, generally including physicians, nurses, medical assistants, healthcare support workers, physical therapists, nutritional therapists, psychotherapists, orderlies, social workers, clerics, volunteers, technical professions, and last but not least also students of all medical and social fields, the patient, and their family. A key element in the formation of the team is the selection of members, who need to take the best care possible of all the needs of not only the patient but also the entire team, and thus fulfil the set objectives. Nowadays, teamwork characterizes modern nursing and medicine. It aims not only to cure the patient or at least ensure the best possible quality of their life, but also support the health of the entire population.

TEAMWORK ASSESSMENT

In order to assess teamwork in healthcare, it is necessary to understand the basics of team functioning and also the specifics of its functioning. An essential step in the preparation for the evaluation of individual teams is the selection of an adequate research method. The psychometric approach appears pivotal for the measurement and evaluation of the efficiency and functionality of medical teams. According to Hayes (2005, p 112),

the most popular general psychometric approaches to team assessment include:

- a) *Belbin Team-Role Self-Perception Inventory (BTRSPI)* – assessing team roles according to Belbin (2003).
- b) *Sixteen-factor questionnaire (16PF)* – assesses 16 personality factors in adults; used in clinical practice and education, as well as in work and organizational psychology.
- c) *Occupational Personality Questionnaire (OPQ)* – evaluates 30 different aspects of an individual's behaviour, interests, and characteristics at work.
- d) *Team Climate Inventory (TCI)* – defines five factors that have a major impact on innovation at work (participative safety, support for innovation, vision, task orientation, social desirability). All the factors are further divided into subscales that assess different aspects of the working atmosphere in the team.

Baker and Salas (1992, p 473–475) also studied the principles of team assessment, identifying the following six principles for team evaluation:

- a) Understanding teamwork requires a solid theory as theory is the basis of the measurement instrument, which determines what is actually evaluated.
- b) Both the situation and the maturing of the team affect the team capacities, hence only repeated observation in different situations and points in time will help identify the team skills that are the most dominant and the most important.
- c) It is not practical to evaluate teamwork solely based on tools that rely on personal testimony or are at second-hand. As team members are likely unaware of the team's social dynamics as they work, some form of direct observation will always be required.
- d) Teamwork assessment tools need to be developed, implemented, and evaluated in different types of teams and environments. Without it will not be possible to elaborate and develop theory or measurement tools or identify the basic mechanisms and factors.
- e) Both the evaluator and the teamwork measurement tool must be reliable. Reliability needs to be assessed at two levels: the observer level, as observers are extremely important for overall assessment, and on the level of internal consistency and stability over time.
- f) A thorough validation of measurement to ensure that users acquire accurate data for the assessment of work and for training purposes.

Another, different approach to team performance assessment is the approach of Katzenbach and Smith (1993 In Hayes, p 115–117), who propose monitoring

the team effectiveness with the “Team Performance Curve”. Instead of using the psychometric methods, this approach focuses on the impact of the team in a company and the role the company plays in fulfilling the team task. The approach distinguishes the work group, the real team, the pseudo team, the potential team, and the high performance team.

TEAM ASSESSMENT TOOLS IN HEALTHCARE

Based on the above set criteria, the following three tools were selected from a variety of reliable and validated questionnaires designed to measure and evaluate the effectiveness of medical teams:

1. Nursing Teamwork Survey (Kalisch, Lee, Rochman, 2010, Kalisch, Lee, Salas, 2010, Kalisch, Weaver, Salas, 2009)

The Nursing Teamwork Survey (NTS) is a questionnaire that assesses nursing teamwork at in-patient wards. Despite there being many theories that define teamwork, the basic NTS framework was developed based on Salas’ teamwork theory (Salas, Sims, Burke, 2005 In Kalisch, 2010, p 44) because its foundation is team behaviour and a practical explanation of teamwork dynamics. This framework comprises five basic elements of teamwork: (a) *team orientation* – cohesiveness and the group’s awareness of itself as a team, (b) *team leadership* – structure, direction, and support provided by a formal leader and some of the team members, (c) *mutual performance monitoring* – team awareness and mutual observation of individual team members, without them neglecting their own work, (d) *backup* – team members help each other with their tasks and duties, (e) *adaptability* – adjustment of the working environment as it changes; and three coordination mechanisms: (a) *communication* – active exchange of information between two or more members of the team, (b) *sharing of mental models* – collective mindset, (c) *mutual trust* – the belief that individual team members will act toward supporting the objectives of the team. The NTS is a validated psychometric measurement tool designed primarily for the evaluation of nursing teams at in-patient wards, which uses a five-point Likert scale to evaluate the replies: rarely, 25% of the time, 50% of the time, 75% of the time, always. It consists of 33 key items, divided into five subscales inspired by Salas’ teamwork theory (see above): (a) *trust*, (b) *team orientation*, (c) *backup*, (d) *shared mental model*, (e) *team leadership*.

The questionnaire also contains questions about the demographic data of the respondents, items focusing on work satisfaction, and the number of patients the respondents took care of in their last shift. The inter-

nal consistency of the scale was confirmed using Alfa coefficient, which scored 0.94 for all 33 items in total and from 0.74 to 0.85 for the individual subscales. The test-retest reliability coefficient scored 0.92 in all the items in total, while each subscale had the coefficient ranging from 0.77 to 0.87. Table 1 indicates the reliability of NTS teamwork measurement.

Table 1 Measurement of NTS reliability (n = 1,758) (Kalisch, Lee, Salas, 2010)

Subscale	Sum of squares	Degrees of freedom	F-test	Significance
Trust	868.540	1754	6.247	0.00
Team orientation	878.926	1755	6.788	0.00
Backup	872.935	1755	8.777	0.00
Shared mental mode	580.123	1756	7.317	0.00
Team leadership	953.299	1752	6.938	0.00
Total teamwork	571.742	1756	9.717	0.00

2. Safety Attitudes and Safety Climate Questionnaire (Sexton, Helmreich, Neilands et al. 2006; Shteynberg, Sexton, Thomas, 2005)

Another selected questionnaire measuring teamwork performance in healthcare was the Safety Attitudes and Safety Climate Questionnaire (SAQ). The SAQ was developed for intensive care medicine, operating theatres, standard inpatient wards, and the outpatient sphere. Each version of the SAQ contains identical items, which are only slightly modified depending on the researched clinical area. The SAQ identifies respondent opinions through 6 factors, which are analytically derived from the spheres of the setting: (a) sphere of teamwork climate, (b) sphere of safety climate, (c) sphere of job satisfaction, (d) sphere of perceptions of management, (e) sphere of working conditions, (f) sphere of stress recognition. The SAQ is a single-page (double-sided) questionnaire, which contains 60 items and demographic information such as age, sex, and nationality. It takes 10–15 minutes to complete the questionnaire. The answer to each of the 60 items is rated on a five-point Likert scale (strongly disagree – somewhat disagree – neither agree nor disagree – somewhat agree – strongly agree). Some items are negatively worded; these therefore need to be reverse coded. At the end of the questionnaire the authors provide space for comments. Each SAQ version in the current study includes the section “Communication and Cooperation”, where respondents express their experience with the quality of collaboration and communication, which they have

with all the care providers at their ward/clinic (such as doctors, medical students, nurses, etc.). This part of the questionnaire also processes response with a five-point Likert scale (very low – low – corresponding – high – very high). SAQ reliability was assessed with Raykov's ρ coefficient. The SAQ scale scored ρ 0.90, which indicates its high reliability.

3. Dimensions of Teamwork Survey (Ryan, 2008, Ryan, Cott, 2008)

The last tool assessing the team culture in multidisciplinary medical teams is the Dimensions of Teamwork Survey (Dteam). The Dteam was developed to carry out regular surveys of team culture, which should be part of the internal processes (part of the team information system) of multidisciplinary medical teams. The DTeam team culture parameters are measured at seven levels of team culture: (a) *customer and inter-team issues*, (b) *team-member strengths and skills*, (c) *communication and conflict management*, (d) *roles and interdependence*, (e) *clarity of team goals*, (f) *decision-making and leadership*, (g) *organizational support*. Responses to each item range on a six-point Likert scale from strongly agree (1), moderately agree (2) slightly agree (3), slightly disagree (4), moderately disagree (5) to strongly disagree (6). Once the survey has been completed, points are awarded based on the key provided in a table, which also divides the questions into seven dimensions. The final score can be evaluated as overall or for each dimension separately. Negatively worded items need to be reverse coded (items marked with an asterisk). The validity and reliability of the questionnaire were validated using standard test protocols (see Table 2).

CONCLUSION

International scientific periodicals on healthcare, nursing, and healthcare management publish a great

amount of information about team and teamwork and its evaluation in the mentioned fields. With the growing demands on all types of teams operating in the health sector, it is desirable to expand the knowledge base with the specific issues of the functioning of teams in healthcare and the assessment of their effectiveness or functionality. The next stage of research is preparing national validation of the selected measuring tools (NTS, SAQ, Dteam) for teamwork assessment in healthcare.

REFERENCES

- BAKER, D. P., SALAS, E. 1992. Principles for measuring teamwork skills. *Human Factors: The Journal of the Human Factors and Ergonomics Society*. 1992, vol. 34, no. 4, p. 469–475. ISSN 0018-7208.
- BELBIN, R. M. 2003. *Team roles at work*. 1st ed. Amsterdam: Elsevier, 2003. 141 s. ISBN 0750626755.
- COHEN, S. G., BAILEY, D. E. 1997. What Makes Teams Work: Group Effectiveness Research from the Shop Floor to the Executive Suite. *Journal of Management*. 1997, vol. 23, no. 3, p. 239–290. ISSN 0149-2063.
- HAYES, N. 2005. *Psychologie týmové práce: strategie efektivního vedení týmů*. 1st ed. Prague: Portál, 2005. ISBN 8071789836.
- HOEGL, M., GEMUENDEN, H. G. 2001. Teamwork Quality and the Success of Innovative Projects: A Theoretical Concept and Empirical Evidence. *Organization Science*. 2001, vol. 12, no. 4, p. 435–449. ISSN 1526-5455.
- JAROŠOVÁ, D. 2000. *Teorie moderního ošetrovatelství*. 1st ed. Prague: ISV nakladatelství, 2000. 133 s. ISBN 8085866552.
- KALISCH, B., WEAVER, S. J., SALAS, E. 2009. What Does Nursing Teamwork Look Like? A Qualitative Study *Journal of Nursing Care Quality*. 2009, vol. 24, no. 4, p. 298–307. ISSN 1057-3631.
- KALISCH, B., LEE, H., SALAS, E. 2010. The Development and Testing of the Nursing Teamwork Survey. *Nursing Research*. 2010, vol. 59, no. 1, p. 42–50. ISSN 0029-6562.

Table 2 Verification of Dteam validity and reliability (Ryan, 2008)

Teamwork dimension	Internal consistency (n = 116)	Inter-item reliability (n = 28)	Test/Retest reliability (n = 16)	Convergent validity (n = 104)
Customer and inter-team issues	0.47	0.58*	0.84*	0.46*
Team-member strengths and skills	0.81	0.69*	0.93*	0.72*
Communication and conflict management	0.77	0.45*	0.96*	0.84*
Roles and interdependence	0.77	0.58*	0.96*	0.74*
Clarity of team goals	0.81	0.60*	0.95*	0.71*
Decision-making and leadership	0.69	0.46*	0.96*	0.79*
Organizational support	0.67	0.28	0.97*	0.63*

* $p < 0,05$

- KALISCH, B., LEE, H., ROCHMAN, M. 2010. Nursing staff teamwork and job satisfaction. *Journal of Nursing management*. 2010, vol. 18, no. 8, p. 938–947. ISSN 1365-2834.
- KATZENBACH, J. R., SMITH, D. 1993. The Wisdom of Teams: Creating the High-performance Organization. In HAYES, N. 2005. *Psychologie týmové práce: strategie efektivního vedení týmů*. 1st ed. Prague: Portál, 2005. ISBN 8071789836.
- KOLAJOVÁ, L. 2006. *Týmová spolupráce: jak efektivně vést tým pro dosažení nejlepších výsledků*. 1st ed. Prague: Grada, 2006. ISBN 80-247-1764-6.
- RYAN, P. D. 2008. *Dimensions of teamwork survey*. [on line]. Regional Geriatric Program of Toronto. [cit. 12-04-18]. Available at WWW: <http://rgp.toronto.on.ca/PDFfiles/Dteamsurvey.pdf>.
- RYAN, P. D., COTT, A. Ch. 2008. *Team Profile Summary The Acapulco Team Swan Valley Mexico*. [on-line]. Geriatrics interprofessional interorganizational collaboration. [cit. 12-04-18] Available at WWW: <http://rgps.on.ca/giic/Giic/pdfs/Team%20Profile%20Summary%20Example.doc>
- SALAS, E., SIMS, D. E., BURKE, C. S. 2005. Is there a “Big Five” in teamwork? In KALISCH, B., LEE, H., SALAS, E. 2010. The Development and Testing of the Nursing Teamwork Survey. *Nursing Research*. 2010, vol. 59, no. 1, p. 42–50. ISSN 0029-6562.
- SEXTON, J. B., HELMREICH, R. L., NEILANDS, T. B. et al. 2006. The Safety Attitudes Questionnaire: psychometric properties, benchmarking data, and emerging research. *BMC Health Services Research*. 2006, vol. 6, no. 44, 10 pp. ISSN 1472-6963 Available at WWW: <http://www.biomedcentral.com/1472-6963/6/44>.
- SHTEYNBERG, G., SEXTON, B. J., THOMAS, E. J. 2005. *Test Retest Reliability of the Safety Climate Scale*. [on-line]. Technical Report 01–05. The University of Texas Center of Excellence for Patient Safety Research and Practice (AHRQ grant # 1P01HS1154401 and U18HS1116401). [cit 12-04-10]. Available at WWW: http://www.uth.tmc.edu/schools/med/imed/patient_safety/questionnaires/.

CONTACT DETAILS OF AUTHOR

Dana Dolanová
Department of Nursing
Faculty of Medicine, Masaryk University Brno
Kamenice 3
CZ-625 00 BRNO
dolanova@med.muni.cz